

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (currently amended) A plant comprising:

an absorber that is configured to separately receive a first and a second portion of a feed gas vapor, a first and a second portion of a feed gas liquid, and a first and a second portion of a distillation column overhead;

wherein the absorber is configured such that the first portion of the feed gas vapor and the first portion of the distillation column overhead provide reflux to the absorber, and such that the second portion of the distillation column overhead provides a vapor stream enriched in ethane for ethane re-absorption at a bottom portion of the absorber; and

a control unit that controls a ratio of at least one of the first and second portion of the feed gas vapor, the first and second portion of the feed gas liquid, and the first and second portion of the distillation column overhead as a function of a desired recovery rate of a feed gas component in a bottom product of a distillation column.
2. (original) The plant of claim 1 wherein the distillation column is configured to operate as at least one of a demethanizer and a deethanizer, and wherein the feed gas component in the bottom product is ethane.
3. (original) The plant of claim 1 wherein the ratio determines absorber overhead temperature.
4. (original) The plant of claim 1 wherein the absorber is configured to operate at an absorber pressure, wherein the distillation column is configured to operate at a distillation column pressure, and wherein the absorber pressure is greater than the distillation column pressure.
5. (original) The plant of claim 4 wherein an absorber bottom product is expanded to provide at least a portion of feed gas chilling.

6. (original) The plant of claim 1 wherein the second portion of the distillation column overhead is fed to the bottom of the absorber to thereby form a stripping gas stream.
7. (original) The plant of claim 1 wherein the control unit controls a ratio of at least two of the first and second portion of the feed gas vapor, the first and second portion of the feed gas liquid, and the first and second portion of the distillation column overhead.
8. (original) The plant of claim 1 wherein the control unit controls a ratio of the first and second portion of the feed gas vapor, the first and second portion of the feed gas liquid, and the first and second portion of the distillation column overhead.
9. (original) The plant of claim 2 wherein ethane recovery in the bottom product increases when the first portion of the feed gas vapor increases relative to the second portion of the feed gas vapor.
10. (original) The plant of claim 2 wherein ethane recovery in the bottom product increases when the first portion of the distillation column overhead decreases relative to the second portion of the distillation column overhead.
11. (currently amended) A method of operating a plant comprising:

providing an absorber and a distillation column, wherein the absorber receives a plurality of absorber feed streams and provides a bottom product to the distillation column;

splitting at least one of the feed streams into a first and second portion, and introducing the first and second portions at different locations to the absorber;

feeding a first portion of a distillation column overhead to the absorber as a reflux and a second portion of the distillation column overhead as an ethane-enriched vapor stream to the absorber for ethane re-absorption at a bottom portion of the absorber;

and

using a flow ratio between the first and second portions to control recovery of a desired product in a bottom product of the distillation column.

12. (original) The method of claim 11 further comprising a step of splitting another one of the feed streams into a first and second portion, and introducing the first and second portions at different locations to the absorber, and using a flow ratio between the first and second portions of the feed streams, respectively, to control recovery of the desired product in the bottom product of the distillation column.
13. (original) The method of claim 11 wherein the plurality of feed streams comprises a natural gas liquids vapor and natural gas liquids liquid.
14. (original) The method of claim 13 wherein the natural gas liquids vapor and natural gas liquids liquid are provided by a high-pressure separator.
15. (original) The method of claim 13 wherein the desired product in the bottom product of the distillation column is ethane.
16. (original) The method of claim 11 wherein the absorber is operated at a pressure that is higher than a pressure in the distillation column.
17. (currently amended) A method of operating a natural gas liquid plant, comprising:

providing an absorber that is fluidly coupled to a distillation column, wherein the absorber receives a feed gas vapor, a feed gas liquid, and an overhead product from the distillation column; and

~~feeding at least two of (a) a portion of the feed gas vapor, (b) a portion of the feed gas liquid, and (c) controlling flow of a vapor portion of the overhead product to the bottom of the absorber in a manner effective~~ and flow of a liquid portion of the overhead product to the top of the absorber to control absorber overhead temperature such that ethane content in a bottom product of the distillation column increases when the absorber overhead temperature decreases.
18. (original) The method of claim 17 wherein the absorber is operated at a pressure that is higher than a pressure in the distillation column.

19. (original) The method of claim 17 wherein the portion of the feed gas vapor and the portion of the overhead product are used as absorber reflux.
20. (original) The method of claim 17 wherein the portion of the feed gas vapor, the portion of the feed gas liquid, and the portion of the overhead product are fed to the absorber.